Haier

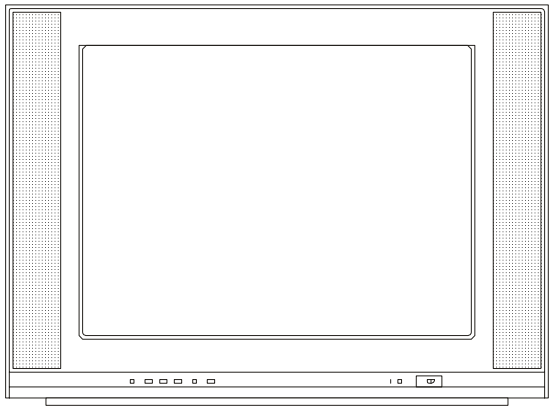
CAUTION:

READ THIS MANUAL CAREFULLY
TO DIAGNOSE TROUBLE CORRECTLY
BEFORE OFFERING SERVICE

SERVICE MANUAL

COLOR TV

MODEL: MT2028D-BLK
(TMPA8873PSCNG)



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WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered b electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product deal with in this service information by anyone else could result in serious injury or death.

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1. Specification

NO.	ITEM	FUNCTION	MODEL 21F07	NO.	ITEM	FUNCTION	MODEL 21F07
			USA				USA
1	**PICTURE**	Main IC	TMPA8873PSCNG	24	**SOFTWARE**	Digital curtain	×
2		CRT	flat	25		Slow fading on & off	×
3		Color system	NTSC+ATSC	26		Semitransparent menu	√
4		Audio system	M	27		Non-flshing channel changing	√
5		NO.of channels	181	28		ZOOM	√
6		OSD language	ENGLISH/F/S	29		16:9 mode	√
7		Multi-picture modes	4	30		Games	×
8	**AUDIO**	AV stereo	√	31		Calendar	×
9		Super woofer	×	32		Child-lock	×
10		Surrounding sound	×	33		V-CHIP	√
11		Treble/bass boost	×	34		No-picture listening	×
12		Left/right balancer	√	35		Background light	×
13		NICAM	×	36		Sleep timer	√
14		Multi-audio modes	×	37		Q.view	√
15		Tone adjuster	×	38		CCD	√
16		MTS/SAP	√	39	**PARAMETER**	NO. of built-in speakers	2
17		Auto-volume leveling	×	40		Audio output power(W)	2×2
18	**JACK**	AV input	back 1,front1	41		Total power input（W）	85
19		AV output	back 1	42		Voltage range（V）	AC120
20		DVD terminal	back 1	43		Power frequency（Hz）	60
21		S-video jack	back 1	44		Time of sleep timer(MINS)	240
22		Headphone socket	√	45		Net weight(KG)	24
23		SCART socket	×	46		Gross weight(KG)	26
				47		Net dimension(MM)	576×395×458
				48		Packaged dimension(MM)	650×565×525

2. Warning

Safety Precautions

IMPORTANT SAFETY NOTICE

Many electrical identify these parts and mechanical parts in this chassis have special safety-related characteristics! In the Schematic Diagram and Replacement Parts List.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.

Do not modify the original design without permission of the manufacturer.

General Guidance

An Isolation Transformer should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents that might result in personal injury caused by electrical shocks.

It will also protect the receiver and it’s components from being damaged by accidental shorts of the circuitry that might be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with a specified one.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Due to the high vacuum and large surface area of the picture tube, extreme care should be taken in handling the Picture Tube. Do not lift the Picture Tube by its Neck.

X-RAY Radiation

Warning:

The source of X-RAY RADIATION in this TV receiver is the High Voltage Section and the Picture Tube.

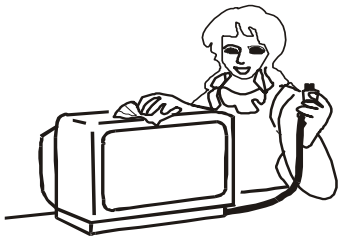
For continued X-RAY RADIATION protection, the replacement tube must be of the same type as specified in the Replacement Parts List.

Before returning the receiver to the customer,

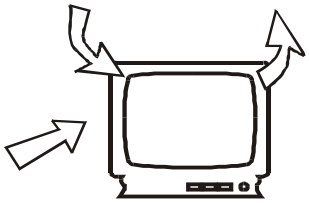
Always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to make sure that the set is safe to operate without any danger of electrical shock.

Warning and Cautions

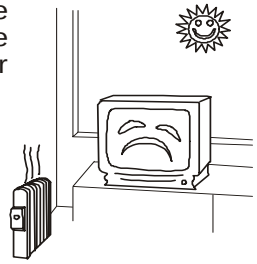
1. When you clean the TV set, please pull out the power plug from AC outlet. Don't clean the cabinet and the screen with benzene, petrol and other chemicals.



2. In order to prolong the using life of the TV set, please place it on a ventilated place.

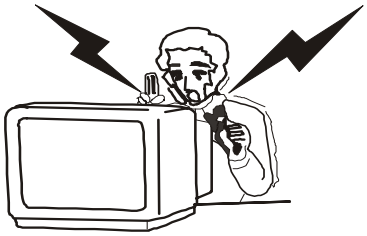


3. Don't place the TV set in the sunshine or near heat source.

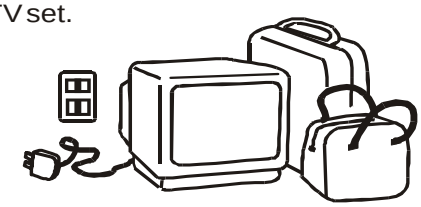


4. To prevent the TV set from firing and electric shock, don't make the TV set rain or moisture.

5. Don't open the back cover, otherwise it is possible to damage the components in the TV set and harm you.



6. When the TV set isn't going to be used for long time or it is in thunder and lightening, please pull out the plug from AC outlet and the antenna plug from the cover of the TV set.



Explanation on the display tube

Generally, it is not needed to clean the tube surface. However, if necessary,its surface can be cleaned with a dry cotton cloth after cutting off the power.Don't use any cleanser. If using hard cloth, the tube surface will be damaged.

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS**.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. **Remember: Safety First.**

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before:
   a. Removing or reinstalling any component, circuit board module or any other assembly of the receiver.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

      CAUTION: A wrong substitution part or incorrect installation polarity of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage-measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. Do not test high voltage by “drawing an arc”.
3. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemicals on or near this receiver or any of its assemblies.
5. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)

   CAUTION: This is a flammable mixture.

   Unless specified otherwise in this service manual, lubrication of contacts is not required.
6. Do not defeat any plug / socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
7. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
8. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.

   Always remove the test receiver ground lead last.
9. Use with this receiver only the test fixtures specified in this service manual.

   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatic ally Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components are usually called Electrostatic ally Sensitive (ES) Devices. Examples of

typical ES devices are integrated circuits and some field effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type folder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise even some normally harmless motions such as mutual brushing of your clothes’ fabric or lifting of your foot from a carpeted floor might generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500 ^{o}F to 600 ^{o}F.

Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.

Keep the soldering iron tip clean and well tinned.

Thoroughly clean the surfaces to be soldered. Use a mall wire bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spay-on cleaners.

Use the following unsoldering technique

a. Allow the soldering iron tip to reach normal temperature. (500 ^{o} F to 600^{o} F)

b. Heating the component lead until the solder melts.

c. Quickly draw the melted solder with an anti-static, suction-type solder removal device with solder braid.

CAUTION: Work quickly to avoid overheating the circuit board printed foil.

Use the following unsoldering technique

a. Allow the soldering iron tip to reach normal temperature. (500 ^{o} F to 600^{o} F)

b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.

c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.

CAUTION: Work quickly to avoid overheating the circuit board printed foil.

d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

Remove /Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are of slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined.

Removal

Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.

Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

Carefully insert the replacement IC in the circuit board.

Carefully bend each IC lead against the circuit foil pad and solder it.

Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

“Small-Signal” Discrete Transistor Removal/Replacement

Remove the defective transistor by clipping its leads as close as possible to the component body.

Bend into a “U” shape the end of each of three leads remaining on the circuit board.

Bend into a “U” shape the replacement transistor leads.

Connect the replacement transistor leads to the corresponding leads extending from the

circuit board and crimp the “U” with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

Heat and remove all solder from around the transistor leads.

Remove the heat sink mounting screw (if so equipped).

Carefully remove the transistor from the heat sink of the circuit board.

Insert new transistor in the circuit board.

Solder each transistor lead, and clip off excess lead.

Replace heat sink.

Diode Removal/Replacement

Remove defective diode by clipping its leads as close as possible to diode body.

Bend the two remaining leads perpendicularly to the circuit board.

Observing diode polarity, wrap each lead of the new diode round the corresponding lead on the circuit board.

Securely crimp each connection and solder it.

Inspect (on the circuit board copper side) the solder joints of the two “original” leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections

   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds foil to the circuit board causing the foil to separate from or “lift-off” the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).

2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small “U” in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At other connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

Remove the defective copper pattern with a sharp knife.

Remove at least 1/4 inch of copper, to insure that a hazardous condition will not exist if the jumper wire opens.

Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.

Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.

Carefully crimp and solder the connections.
CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

WARNING
RISKELECTRIC SHOCK
DONOT OPEN

WARNING:To reduce the risk of electric shick don’t remove cover or back.
No user-serviceable parts inside refer service to qualified service personnel.

Safety of operators has been taken into consideration at the design and manufacture phase, but inappropriate operation may cause electric shock or fire. To prevent the productfrom being damaged, the following rules should be observed for the installation, use and maintenance of th product. Read the following safety instruction before starting the operation.
The User Manual uses the following symbols to ensure a safe operation and preventany damage to operators or properties:

3.FEATURES AND TECHINICAL DESCRIPTION

FUNCTIONS :

1.181 channels

2.I^2C bus control

3.Auto scan

4.Audio/video input/output interfaces

5.Multiple picture modes selection

6.Blue screen

7 NTSC + ATSC

8.CCD

9.SLEEP TIMER

10.Q.VIEW

11.V-CHIP

12.ARC(LETTERBOX/ZOOM / FULL)

4. Adjustment

A..Factory adjustment information

Specific operation: use remote controller
Press “MENU” → “8”→”8”→”9”→”3” buttons in sequence to enter into factory mode.Press “MENU” to enter into next factory menu.
Press [CH+] / [CH-] to select items and press [VOL+] / [VOL-] key, to make data adjustment of corresponding factory menus.
Press “EXIT” key to exit factory mode.

B.Maintenance menu (Table 8)

You can change the DATA with “*” mark when necessary.
MENU 00

Items	Preset	Description	predicament
HPOS	0E	60Hz Horizontal shift	
VPOS	03	60Hz Vertical shift	
VSC	15	S emendation	00：+20%
			1F：-20%
VLIN	0C	Vertical slop	00：-12%
			10： 0%
			1F：12%
HIT	32	60Hz Vertical amplitude	
HBOW	03	H BOW emendation	
HPARA	04	H PAPR emendation	
VCEN	17	Vertical centering	00：-20%
			20： 0%
			3F： 20%

MENU 01

Items	Preset	Description	predicament

HPOS-D	00	DTV Horizontal shift	
VPOS-D	00	DTV Vertical shift	
VSC-D	00	DTV S emendation	
VLIN-D	00	DTV Vertical slop	00：-12%
			10： 0%
			1F：12%
HIT-D	00	DTV Vertical amplitude	
DTV-UB	08	Bit 3,2,1,0:DTV U BLK ADJ	0： -22mV， Input DC
			8： 0mV
			F： 19mV， 2.75mV/dev
DTV-VB	08	Bit 3,2,1,0:DTV V BLK ADJ	0： -22mV， Input DC
			8： 0mV
			F： 19mV， 2.75mV/dev

MENU 02

Items	Preset	Description	predicament
HSBLK-S	00	H BLK Right	
HSBLK-E	00	H BLK Left	
VBLK	04	Bit 3,2V BLK BTM	00：310H 263H 01：306H 259H
			10：304H 257H 11：302H 255H
		Bit 1,0:V BLK TOP	00：23H 22H 01：27H 26H
			10：29H 28H 11：31H 30H
HITW	EE	Vertical offset	
YUV-UB	07	Bit 3,2,1,0:YUV U BLK ADJ	0： -22mV， Input DC
			8： 0mV
			F： 19mV， 2.75mV/dev
YUV-VB	07	Bit 3,2,1,0:YUV V BLK ADJ	0： -22mV， Input DC
			8： 0mV
			F： 19mV， 2.75mV/dev

MENU 03

Items	Preset	Description	predicament
RCUT	3B	White point R	
GCUT	45	White point G	
BCUT	3A	White point B	
GDRV	40	Black level offset G	
BDRV	40	Black level offset B	

MENU04

CLTM	2D		
		Bit 7:P/N ID (PAL/NTSC killer sensitivity)	0：Normal 1：LOW
		Bit 6:Killer off	0：Normal 1：Always killer off
		Bit 5:N COMB (Color comb filter for	0：Off

		NTSC)	1：On
		Bit 4:Demodulation Phase	00：PAL 01：NTSC1(93 deg)JAPAN
			10：NTSC2 (108 deg)USA 11：DVD
		Bit 2,1,0:Y Delay Time	000： 0ns 001： 40ns
			010： 80ns 011： 120ns
			100： 160ns 101： 200ns
			110： 240ns 111： 280ns
CLVO	AD	Chroma data (VIDEO)	
CLVD	08	Chroma data (DTV/YUV)	
STM	05	Bit 3,2,1,0:S Trap f0 For M	0000： Sound-Trap Off
			0001： f0 Tuning Min
			1111： f0 Tuning Max
SSM	0B	Bit5,4:S Trap Frequency response Control HP/LP For M	00： Off 01： 1dB HPF
			10： -3dB LPF 11：-2dB LPF
		Bit3,2:S Trap Q. for M	00： Q=3 01： Q=5
			10：Q=7(Recmmended) 11：Q=9
		Bit1,0:S Trap Group Delay Control for M	00： Off 01： 60ns
			10： 90ns 11： 120ns
ABCL	0E	Bit 7:Nouse	
		Bit 6:Y Peak Limiter	0：Y peak limiter off 1：Y peak limiter on，105IRE
		Bit 5:ACL STATR POINT	00：0V 01：-0.2V
			10：-0.3V 11：-1.0V ACL OFF
		Bit 3:ABL START POINT	00： 0V 01： -0.2V
			10： -0.30V 11： -0.4V
		Bit 1:ABL GAIN	00： -0.2V 01： -0.35V
			10： -0.5V 11： -0.65V
DCBS	11	TV/AV/YUV(COMP.) data	
		Bit 7:C Trap Q	0：LOW 1：High
		Bit 6:Blanking switch	0：H，V blanking on 1：H，V blanking off
		Bit 5:Y Coring SW	0：OFF 1：ON
		Bit 4:Blank Strech SW	0：OFF 1：ON
		Bit 3:Y GAMMA	00：off 01：Y point 78IRE，Gain -6dB
			10：68IRE 11：58IRE
		Bit 1:Blank Strech	00：Black strech point=30IRE 01：40IRE
			10：50IRE 11：75IRE
	10	DTV data	

DCBS-D		Bit 7:C Trap Q _Y	0：LOW 1：High
		Bit 6:Blanking switch	0：H，V blanking on　1：H，V blanking off
		Bit 5:Y Coring SW	0：OFF　　1：ON
		Bit 4:Blank Strech SW	0：OFF　　1：ON
		Bit 3:Y GAMMA	00：off　　01：Y point 78IRE，Gain -6dB
			10：68IRE　　11：58IRE
		Bit 1:Blank Strech	00：Black strech point=30IRE　01：40IRE
			10：50IRE 11：75IRE

MENU05

UCOM	00	Bit 5:FM BAND	0：Normal　　1： Wide
		Bit 4,3:C APC DATA	00：data 1-normal　for black &white &NTSC 01： Data 2
			10：Data 3 for PAL　11：the same as 10
		Bit2:Set chroma APC	0：Disable　1：enable use Bit 3，4 data
		Bit 1,0:Internal ADC	00：GND　　01：R output
			10：B output 11：Monitor RF AGC via ADC
HAFC	86	Bit 7,6:AFC GAIN (AFC Fix=0， TV 模式且弱信号，判断到 Nois_Bit4=0 时 ）	Data Description
			Blanking period　　Picture period
			00：　2　　1
			01：　4　　2
			10：　2/3　　1/3
			11：　OFF　　OFF
		Bit 5,4:AFC GAIN	Data　Description
			Blanking period　　Picture period
			00：　2　　1
			01：4　　2
			10：2/3　　1/3
			11：OFF　OFF
		Bit 3,2:AFC GAIN	Data　Description
			Blanking period　　Picture period
			00：2　　1
			01：4　　2
			10：2/3　　1/3
			11：OFF　OFF
		Bit 1,0:AFC GAIN	Data　Description
			Blanking period　　Picture period
			00：2　　1
			01：　4　　2
			10：　　2/3　　1/3

			11： OFF OFF
NOIS	09	Bit4:AFC Fix	
		Bit 3-0:Compare to NOISE DET	
HAFD	01	Bit 7-2:No use	Data Description
		Bit 1,0:AFC GAIN	Data Description
			Blanking period Picture period
			00： 2 1
			01： 4 2
			10： 2/3 1/3
			11： OFF OFF
FLG0	24	Bit 7:VCO readjust when position select	0：disable， 1：enable
		Bit 6:Select f0 of chroma BPF	00：BPF （AV）01：TOF1（F0=5MHZ）RF
			10：TOF2（F0=6MHZ）RF 11：TOF3（F0=7MHZ）RF
		Bit 4:BPF-SW	0：Normal，CVBS signal passes along BPF
			1：By pass， CVBS signal doesn't pass along BPF.
		NBit 3:ouse	
		Bit 2:Nyquist Buzz cancel	0：Nyquist Buzz cancel， on 1：off
		Bit 1:Nouse	
		Bit 0:Over mode	0：Normal 1：PIF over modulation switch on
FLG1	1A	Bit 7,6,5:Nouse	
		Bit 4:MainBoard SW	0：TV： 00， AV2： 01
			1：TV： 01， AV2： 00
		Bit 3:Horizontal side blanking	0：Off
			1：On
		Bit 2:Nouse	
		Bit 1:V ramp bias	0： Y/C VCC
		V ramp bias	1： IC
		Bit 0:CW SW	0：Off 1：On
VCD0	08	Bit7,6:Audio Monitor Out	00：depand on Audio sw 01：TV
			10： Mute 11： Mute
		Bit5,4:C Trap MD	00： interlocking video sw 01 ：as 00
			10：not interlocking C-trip off 11 :not interlock ctrip on
		Bit3:Halftone Gain	0： Main： OSD = 30% ：70%
			1： Main： OSD = 50% ：50%
		Bit2:U/V Switch	0： Cb/Cr， Cr input(#21)gain up，+3dB；1： U/V
		Bit1:Sharpness f0 frequency	0： 2.75MHz
		SHARPNESS f0 switch	1： 4MHz
		Bit0:Sync. skew switch	
VCD1	00	Bit7,6:Nouse	

		Bit5,4:PIF_DET_LVL	00：2.1Vp-p 01 ：2.2Vp-p
			10：2.3Vp-p 11：2.4Vp-p
		Bit3,2:FM BPF	00： internal BPF mode 01： not use
			10： not use 11： external BPF mode
		Bit1,0:Nouse	

MENU06

SYNC	00	Bit2: H sync judgement	0：BUS
			1：TC3
		Bit1:sync_sep level	0：40% 1：50%
		Bit0:Sync slice level for weak signal	0：normal 1：low for weak signal
SYBBN	48	Sync detection setting for BB On	
		Bit6:Sel LPF mode for sync det SY-DET-3	recommend 1
		Bit5:Sel SY-DET-2 for sync dtection	recommend 0
		Bit4:Sel SY-DET-1 for sync dtection	recommend 0
		Bit3:H lock detection mode	00：-8dB weak signal; 01：-4dB;
		Bit2:Window pulse for H lock detection	10/11：0dB
		Bit1:Sync detection place choice	00：H_lock_1 R0.3 01：H_lock_2 R1.4
		Bit0	10：V_lock R1.7
SYBBF	48	Sync detection setting for BB Off	
		Bit6:Sel LPF mode for sync det SY-DET-3	recommend 1
		Bit5:Sel SY-DET-2 for sync dtection	recommend 0
		Bit4:Sel SY-DET-1 for sync dtection	recommend 0
		Bit3:H lock detection mode	00：-8dB weak signal; 01：-4dB;
		Bit2:Window pulse for H lock detection	10/11：0dB
		Bit1:Sync detection place choice	00：H_lock_1 R0.3 01：H_lock_2 R1.4
		Bit0	10：V_lock R1.7
SYSR	48	Sync detection setting for search/tuning	
		Bit6:Sel LPF mode for sync det SY-DET-3	recommend 1
		Bit5:Sel SY-DET-2 for sync dtection	recommend 0
		Bit4:Sel SY-DET-1 for sync dtection	recommend 0
		Bit3:H lock detection mode	00：-8dB weak signal; 01：-4dB;
		Bit2:Window pulse for H lock detection	10/11：0dB
		Bit1:Sync detection place choice	00：H_lock_1 R0.3 01：H_lock_2 R1.4
		Bit0	10：V_lock R1.7
BBCT	04	Blue back hysteresis counter (BUS H sync detection)	

NDTC	1F	NOISE DET count (Weak -> Normal)	
RAGC	01	RF-AGC	00-07

MENU07

AUCON1	11	Bit7-4:TDA9850 A05 D3-0 CON2_noise threshold for SAP_SP3,SP2,SP1,SP0	
		Bit3-0:TDA9850 A04 D3-0 CON1_noise threshold for STEREO_ST3,ST2,ST1,ST0	
AUCON2	0A	Bit4:TDA9850 A09 D7 ALI2_Stereo level switch_STS_1: STon < 35mV; 0: Ston < 30mV.	
		Bit3-0:TDA9850 A07 D3-0 CON4_input level adjustment_L0 to L3	
AUALI1	00	TDA9850 A08 D4-0_ALI1_for wideband expander	
AUALI2	00	TDA9850 A09 D4-0_ALI2_for spectral expander	
AUTIM	03	TDA9850 A0A D2-0_TC0 to TC2_timing current alignment data	
AUSTP	01	Audio mute step	

MENU08

V01	0D	VOLUME OUTPUT DATA AT 1%	
V25	3D	VOLUME OUTPUT DATA AT 25%	
V50	57	VOLUME OUTPUT DATA AT 50%	
V100	7F	VOLUME OUTPUT DATA AT MAX	
BL25	1E	% of ATT for Balance 25	
BL49	50	% of ATT for Balance 49	
ALC	00	ALC= 0：OFF;　ALC=1,2,3: On	

MENU09

V01-D	0D	DTV VOLUME OUTPUT DATA AT 1%	
V25-D	42	DTV VOLUME OUTPUT DATA AT 25%	
V50-D	60	DTV VOLUME OUTPUT DATA AT50%	
V100-D	7F	DTV VOLUME OUTPUT DATA AT MAX	
BRTC-D		DTV　brightness center	

BRTX-D		DTV brightness max	
DTV-OPT1	01	Bit3:DTV one part number input(no signal)	0: ATV 1: DTV
		Bit2:ARC	1: G2 side, 0: DLV side
		Bit1:RRT Update	1： Yes； 0： No
		Bit0:PAT, PMT Update	1： Yes； 0： No
DTV-OPT2	00		

MENU10

CNTX	7F	contrast max	
CNTC	50	contrast center	
CNTN	00	contrast min	
SCNT	0B	Y-SUB CONTRAST	
CNTD	FE	DTV CONTRASRT CENTER	
CNTZ	FF	YUV CONTRASRT MAX	
BRTC	4C	SUB BRIGHT CENTER	
BRTS	00	SUB BRIGHT	

MENU11

BRTX	28	SUB BRIGHT MAX	
BRTN	1A	SUB BRIGHT MINIMUM	
COLX	1B	SUB COLOR MAX	
COLN	0D	SUB COLOR MINIMUM	
COLC	36	SUB COLOR CENTER FOR NTSC	
COLD	03	SUB COLOR CENTER FOR DTV	
COLZ	03	SUB COLOR CENTER FOR DVD	

MENU12

TNTX	40	SUB TINT MAX	
TNTT	40	SUB TINT CENTER FOR NTSC	
TNTV	40	SUB TINT CENTER FOR AV	
TNTN	40	SUB TINT MINIMUM	
TNTD	42	SUB TINT CENTER FOR DTV	
TNTZ	40	SUB TINT CENTER FOR YUV	

MENU13

ASSH	00	ASYMMETRY – SHARPNESS	
SHPX	32	SUB SHARPNESS MAX POINTS FROM CENTER VALUE	
SHPN	19	SUB SHARPNESS MIN POINTS FROM CENTER VALUE	
ST3	18	SUB SHARP CENTER NTSC3.58 IN	

		TV	
SV3	20	SUB SHARP CENTER NTSC3.58 IN VIDEO	
SV-DTV	18	SUB SHARP CENTER IN DTV	
SV-YUV	20	SUB SHARP CENTER IN YUV	
NSHP	1A	Not used	

MENU14

OSDF	64	OSD Frequency	
OSD	45	OSD reference	
OSDA	02	OSD BRIGHTNESS adjust	
		Bit 7-4:Nouse	
		Bit 3:OSD ABL	0：ABCL active for OSD 1：inactive
		Bit 2:Nouse	
		Bit 1,0:OSD CONTRAST	00：95 IRE 01：60 IRE
			10：70 IRE 11：80 IRE
CCD-OSD	2E	CCD OSD Horizontal shift	
CCD-OSDF	59	CCD OSD reference	
ONTM	00	exchance channel latency time	
VPCT	02	Not used	
V-MUTE	80	Bit 7:V mute_type	0： Y-Mute 1： RGB-Mute
		Bit 6,5:Nouse	
		Bit 4,3,2,1,0:V mute time	00： 8ms， 25： 200ms

MENU15

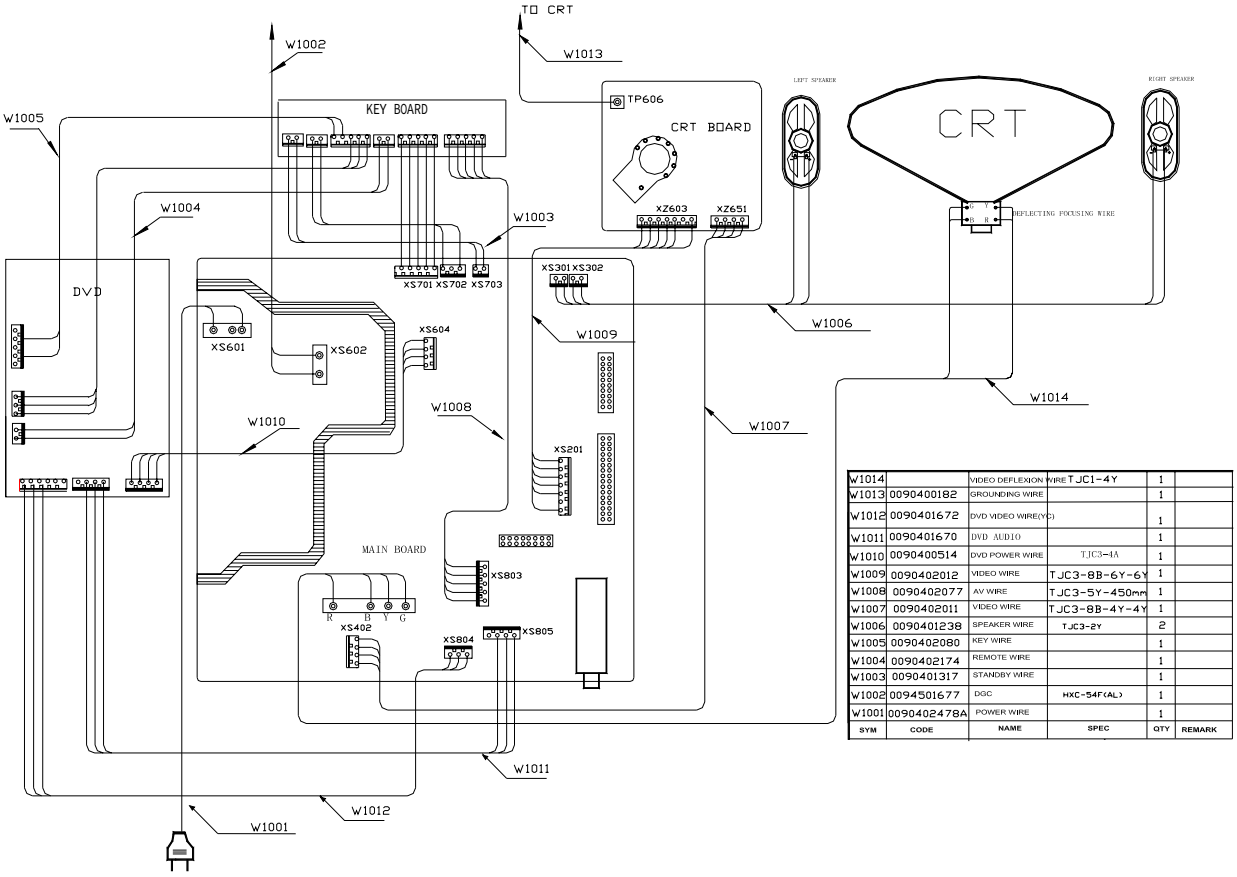
DVD-BLK-T	18	DVD-on latency time	
DVD-OFF-T	20	DVD-off latency time	
ON-DLY-T	04	POWER-on latency time	
AV-SW	1B	Bit 5-7:Nouse	
		Bit 4:VIDEO1	1： used; 0：Nouse
		Bit 3:VIDEO2	1： used; 0：Nouse
		Bit 2:S-VIDEO	1： used; 0：Nouse
		Bit 1:YUV (COMP.)	1： used; 0：Nouse
		Bit 0:DVD	1： used; 0：Nouse
FAC-MOD	OFF		
EJTAG	OFF		
BTSC-SW	ON		

MENU16

OPTM1	C7	Bit 7:Fjp_dmode	0： JP D mode， 1： Haier D Mode
		Bit 6:Frestart_mode	0: No error deal if DLV abnormal, 1：Deal
		Bit 5:Screen Format mute control	0: control by DLV 1：control by G2 (150ms)
		Bit 4:ABL control	0: No act when pic mode change 1：change

			one by one
		Bit 3:Fmonitor_sync	0： TV-OUT， 1： Varia-OUT
		Bit 2:Nouse	
		Bit 1:Local Key	0： TSB Local key， 1： Haier local key
		Bit 0:Fjp_stereo	0： Mono mode， 1： stereo mode
OPTM2	C2	Bit 7:ALC ON/OFF mute	0：none 1：on
		Bit 6:TINT polarity ，input to V/C/D.	0：normal 1：invert
		Bit 5:G2_Pin59_opt	
		Bit 4:ABL control for tune	0: No act when tune 1：change one by one
		Bit 3:DTV dot number input	0: invalid 1: DTV
		Bit 2:G2-Pin48_opt	
		Bit 1:AV SW error (only for debug)	0: Deal 1: Not deal
		Bit 0:DVD fashion	0：DVD input from S-video， 1： DVD input from YUV
OPTM3	F7	Bit 7:Sync_det_bb (sync mode： 1)	0：H-Lock&Sync-Det
			1：H-Lock&Sync-Det&Noise-Det
		Bit 6:SPOT Kill when power off	0：Normal，1：BB, SPOT KILL=1 when power off
		Bit 5:Selected Sync Mode	0：Input external C.Sync
			1：Read I2C BUS Data
		Bit 4:TB1231N V Freq	0： 50Hz; 1： 60Hz
		Bit 3:Nouse	
		Bit 2:V-Mute ON/Off when CH change	0： OFF; 1： ON
		Bit 1:Nouse	
		Bit 0:B.B_mute	MUTE; 1: Ok, 0: No
OPTM4	00	Bit 7:DLV error counter opt (only used in debug version)	
		Bit 6:DVD osd display	0: osd display after delay time, 1: osd display at once
		Bit 4-5:Power on action	00：standby; 01: Last status，10,11：Power on
		Bit 3-0:00-0f: mute time 00- 64ms when format size change	
OPTM5		Nouse	
OPTM6		Nouse	
OPTM7		Nouse	
OPTM8		Nouse	

5. WIRING CONNECTION DIAGRAM



SYM	CODE	NAME	SPEC	QTY	REMARK
W1014		VIDEO DEFLEXION WIRE	TJC1-4Y	1	
W1013	0090400182	GROUNDING WIRE		1	
W1012	0090401672	DVD VIDEO WIRE(YC)		1	
W1011	0090401670	DVD AUDIO		1	
W1010	0090400514	DVD POWER WIRE	TJC3-4A	1	
W1009	0090402012	VIDEO WIRE	TJC3-8B-6Y-6Y	1	
W1008	0090402077	AV WIRE	TJC3-5Y-450mm	1	
W1007	0090402011	VIDEO WIRE	TJC3-8B-4Y-4Y	1	
W1006	0090401238	SPEAKER WIRE	TJC3-2Y	2	
W1005	0090402080	KEY WIRE		1	
W1004	0090402174	REMOTE WIRE		1	
W1003	0090401317	STANDBY WIRE		1	
W1002	0094501677	DGC	HXC-54F(AL)	1	
W1001	0090402478A	POWER WIRE		1	

6. Circuit Explanation

1、Microprocessor and Small signal processing: super monolithic integrated circuits ：TMPA8873PSCNG

TMPA8873PSCNG is an integrated circuit decoder, containing intermediate image amplifying, horizontal and vertical scan, small signal processing, color decoding, I^2C bus control.

Information introducing functions and testing data for maintenance is listed in Table 1.

Table 1

SYMBOL	PIN	Working Voltage (V)	Ground Resistance (Ω)
DVD_OPEN	1	0.8	36.4M
SWA	2	0.04	12.8K
KEY	3	4.94	19.4K
GND	4	0.004	0.4Ω
RESET	5	4.92	5.5K
X-TAL	6	2.17	33.3M
X-TAL	7	2.01	32.7M
TEST	8	0	0.6Ω
+5V	9	4.94	2.8K
GND	10	0.003	0.6Ω
GND	11	0.003	0.7Ω

SCP-OUT	12	1.08	∞
H-OUT	13	2.16	0.66K
H.AFC	14	5.8	∞
V-SAW	15	4.15	∞
V-OUT	16	4.8	24.1K
H-VCC	17	8.23	0.9K
GND	18	0.003	0.8Ω
Cb	19	3.1	∞
Y-IN	20	2.4	∞
Cr	21	3.1	∞
EXT_AU_1	22	3.46	103K
C-IN	23	0.01	101Ω
EXT-IN	24	2.4	∞
ALC-FILTER	25	0.005	3.6M
TV-IN	26	2.7	∞
ABCL-IN	27	4.86	28.5K
AV_OUT_1	28	3.18	∞
AV_OUT_2	29	3.18	35M
TV-OUT	30	2.88	3.3K
H/L OUT/SIF-OUT	31	4.89	11K
EXT_AU_2	32	3.85	113K
SIF-IN	33	3.1	∞
DC NF	34	2.22	10M
PIF PLL	35	2.4	10M
IF-VCC(5V)	36	4.88	0.72K
S-REG	37	2.2	∞
IAU_MON_OUT	38	3.2	∞
IF AGC	39	2.7	12.87M
IF GND	40	0.004	0.7Ω
IF IN	41	1.98	54.6K
IF IN	42	1.98	54.3K
RF.AGC	43	0.49	∞
BLACK.DET	44	1.78	221K
SVM-OUT	45	2.92	∞
APC FIL	46	2.23	38M
YC 5V	47	4.85	0.71K
SYNC OUT	48	4.55	7.31K
D VCC3.3V	49	3.3	1.06K
R-OUT	50	2.02	83.1K
G-OUT	51	1.89	23M
B-OUT	52	1.89	83K
GND	53	0	0.7Ω
GND	54	0	7.6M
5V	55	4.95	2.8K
MUTE	56	0.009	1.9M
SDA0	57	4.93	12.6K

SCL0	58	4.93	12.6K
ATV/DTV	59	0.008	54K
POWER	60	4.42	69K
DONAU LV WAKE UP	61	2.89	6.4K
DONAU LV RESET	62	4.9	12.25K
RMT-IN	63	0.85	133.6M
DVD_POWER	64	0.02	12.8K

2.Analysis of common path circuits

High frequency television signals, received via an antenna (or transmitted through a cable TV system) to the input terminal of the high frequency tuner U101, are processed for tuning and high frequency amplifying and mixing, then an analog IF signal will go through the sound surface wave filter. Intermediate frequency signals will be transmitted to (38) and (39) of N201(TMPA8873PSCNG). The mixed signals of picture video signals output from (34) of N201.

3.Analysis of sound power amplifying circuits

Sound power amplifying circuits are composed of integrated circuits TDA1517NE and peripheral components.TDA1517NE is an integrated electrical circuit . Information introducing functions and testing data for TDA1517NE maintenance is listed in Table 2.

Table 2

SYMBOL	PIN	DESCRIPTION	Working Voltage (V)	Ground Resistance (Ω)
-INV1	1	Non-inverting input 1	2.16	3.3M
SGND	2	Signal ground	0.004	0.3Ω
SVRR	3	Supply voltage ripple rejection output	6.19	22.9K
Out 1	4	Output 1	76.16	1.3K
PGND	5	Power ground	0.003	0.1Ω
OUT2	6	Output 2	6.19	1.3K
Vp	7	Supply voltage	12.9	∞
M/SS	8	Mute/standby switch input	10.9	21.95K
-INV2	9	Non-inverting input 2	2.162	∞

4.Analysis of vertical sync and vertical scan output circuits

The field sync signals segregated from compound sync signals are used to activate the vertical frequency segregation system which commences when a set amount of vertical sync pulse signals are tested. Of the sync pulse frequencies obtained from segregation, some are transmitted to the vertical tooth wave generator. The vertical frequency tooth wave, after geometric processing, is transmitted from (16) of N201 (TMPA8873PSCNG) to (1) of vertical scan output IC N401 (LA78040).

Information introducing functions and testing data for LA78040 maintenance is listed in Table 3. if a cylindrical color card is installed then a fluke III digital multimeter is used.

Table 3

SYMBOL	PIN	DESCRIPTION	Working Voltage (V)	Ground Resistance (Ω)
INV.IN	1	Inverting input	2.44	9.3K
Vcc	2	Supply voltage	26.3	14.2K

PUMP UP OUTPUT	3	Flyback generator	2.24	∞
GND	4	Ground or negative supply	0.003	0
V.Output	5	Output	13.66	70K
output stage supply	6	Output stage supply	26.7	∞
NOV INV.IN	7	Non-inverting input	2.46	3K

5.Analysis of horizontal sync and horizontal scan output circuits

As the horizontal oscillation circuit is installed inside N201 (TMPA8873PSCNG), . Some brightness signals including compound sync signals are transmitted to the internal sync segregation circuits, where horizontal sync and vertical sync pulses are segregated. Horizontal pumping signals are transmitted from (13) of N201 to horizontal promotion transistor V431 (2SC2383), and then drive the H-DRIVE transformer. After being amplified through it switches power transistor V432 (2SC5885) to control the horizontal scan of the electronic-beam.C412 is a horizontal S correction capacitor and L407 is for horizontal linear inductor. T401 is a horizontal output transformer. The horizontal return pulse output from (ABL) of T401 is transmitted to pin (27) of N201 who controls ABL circuits. ABL avoid high-voltage over rated value that will cause X-ray and affect your health.

6.Analysis of video amplifying circuits

The video amplifying circuits are comprised of V601, V611, V621 and peripheral components. R, G and B signals output from N201 (50), (51) and (52), 3 video power transistor are available for amplifying the input R, G, B. White balance adjustment is completed through N202 under control of an I^2C serial bus control system.

7. Maintenance Service and Trouble shooting

A. Principle integrated circuits

A1. 21 INCH color TV set composed of the following sections

(1) Small signal processing: super monolithic integrated circuits N201(TMPA8873PSCNG). and memory N202 (AT24C16).

(2) Sound power amplifying: integrated circuits N301 (TDA1517NE).

(3) Horizontal and Vertical scan output circuits: Vertical output integrated circuits N401 (LA78040), Horizontal output transistor V432 (2SC5885), Horizontal flying back transformer T401 (JF0501-32806).

(4) Switch power supply: switch transformer T601 (BCK-08A6S), power IC N601 (FSCQ0765RT)

A2. Main integrated circuits:

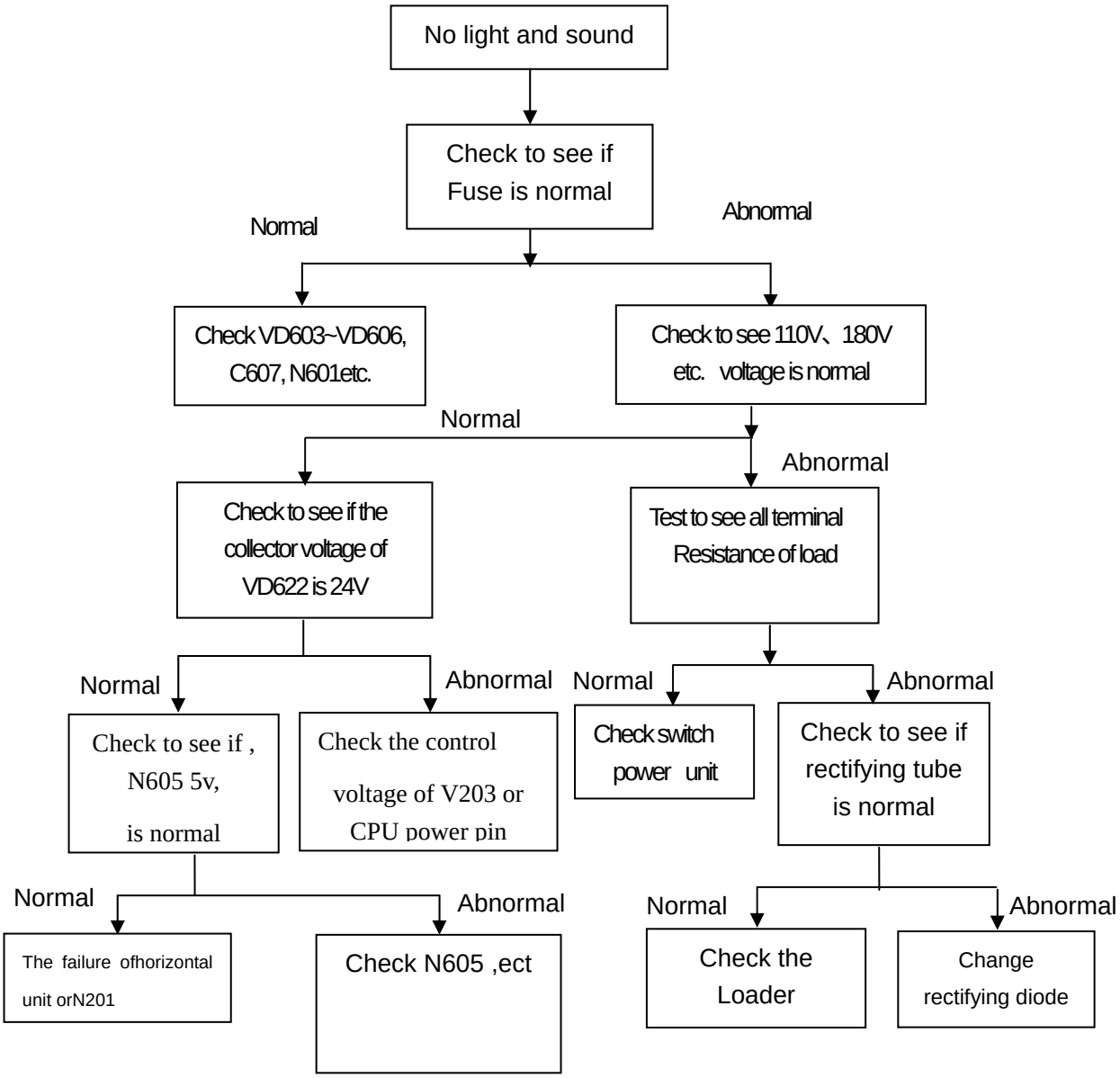
(1) TMPA8873PSCNG Microprocessor
Picture IF/sound IF/video processing/H and V
Scan/color decoding

(2) LA78040 Vertical output integrated circuits

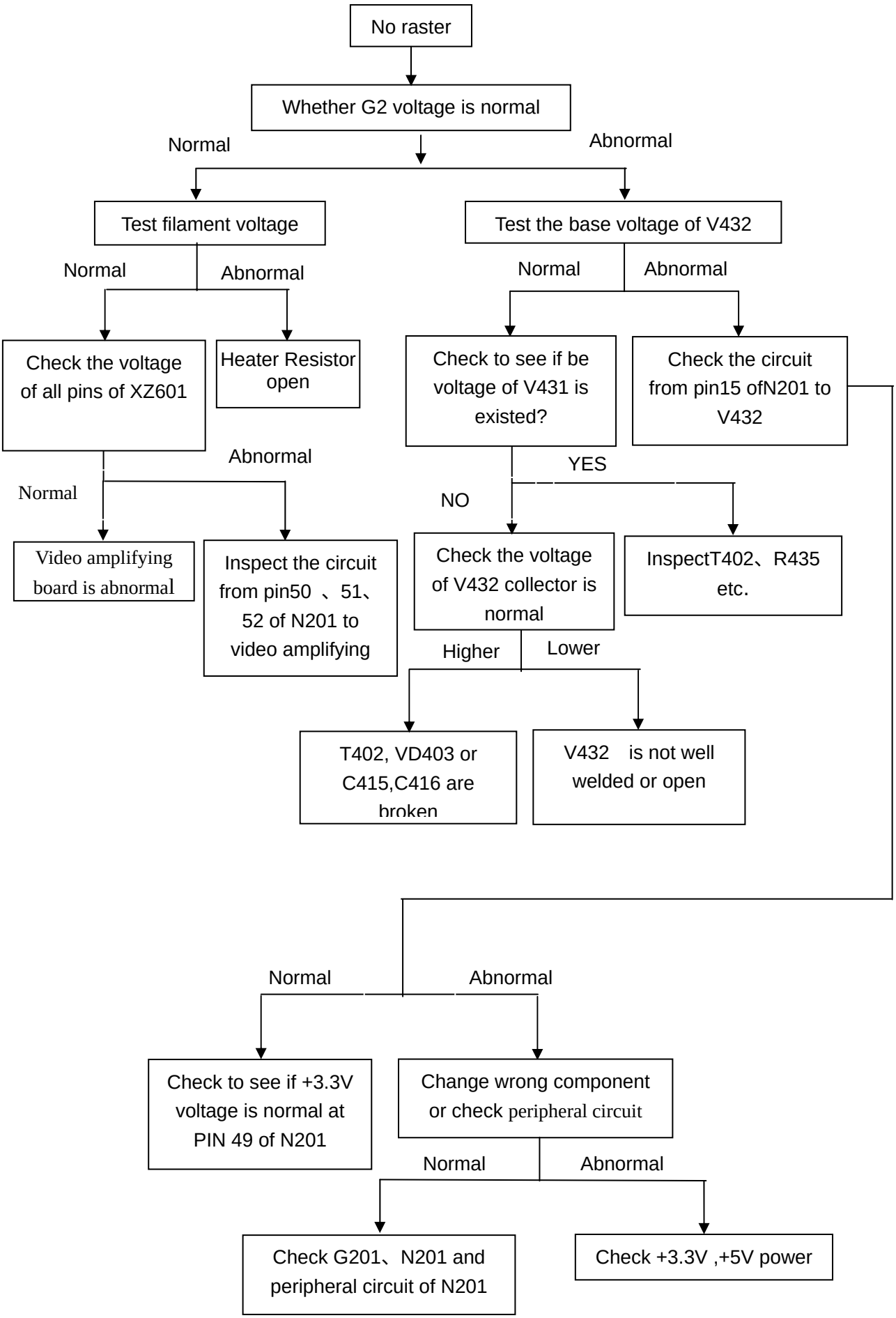
(3) TDA1517NE Sound power amplifying integrated circuits

A3. Error Detection Process

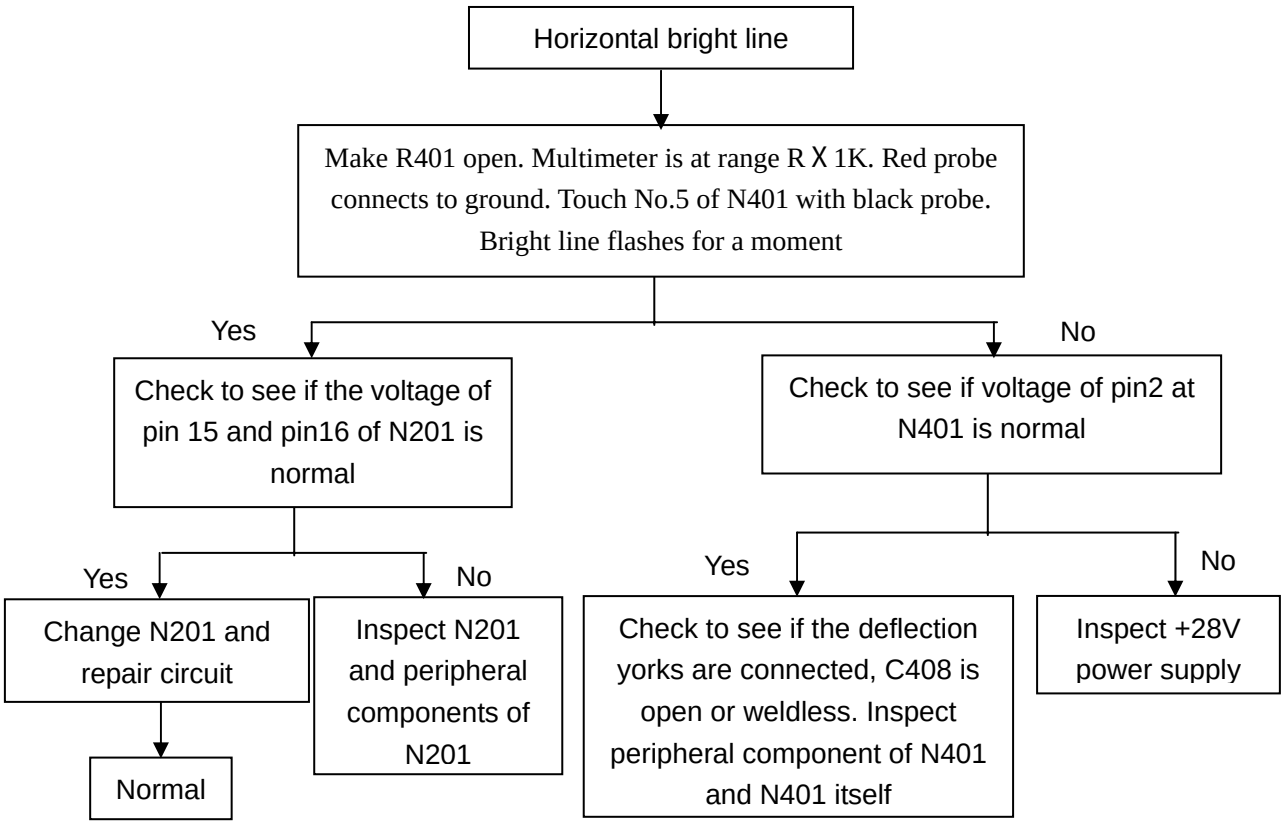
1.



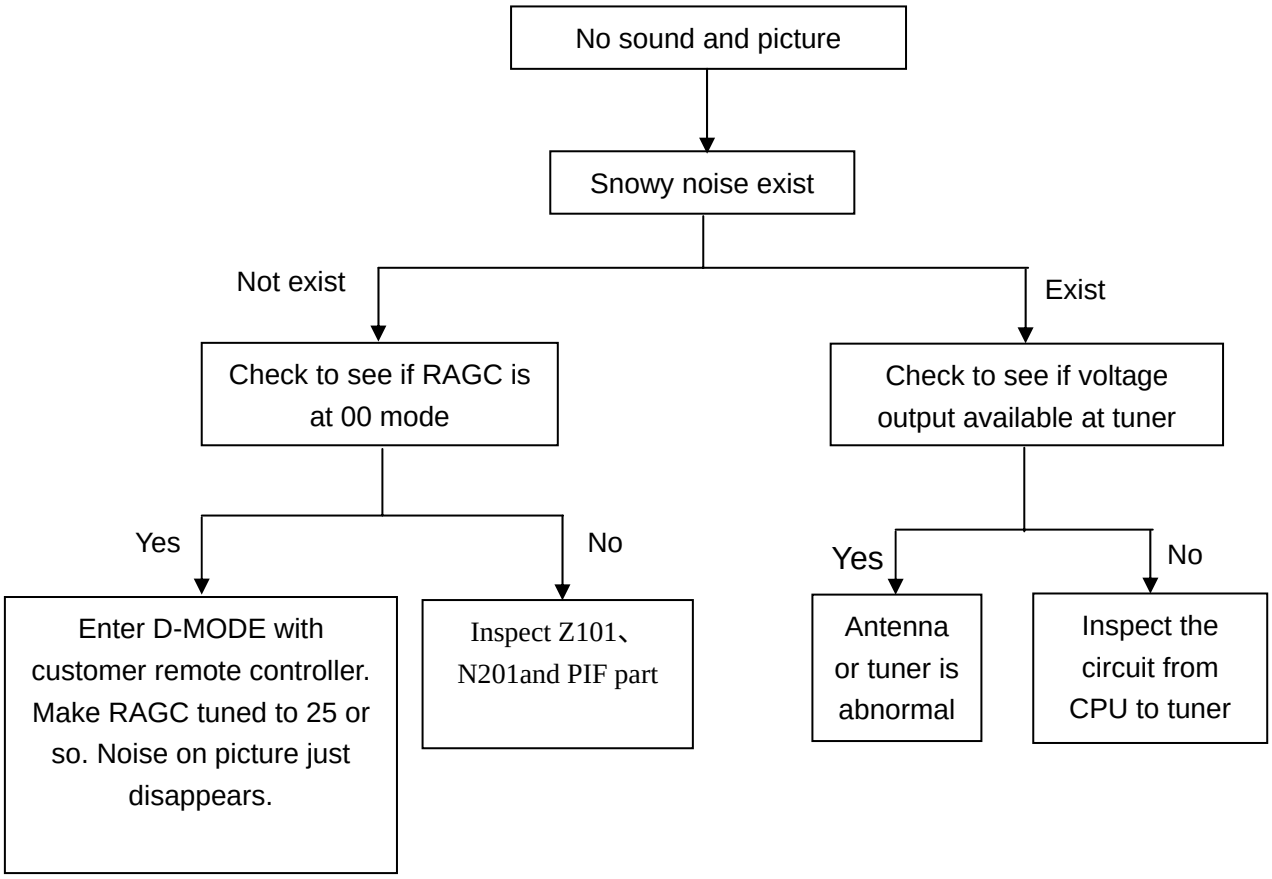
2


No raster
Whether G2 voltage is normal
Normal
Abnormal
Test filament voltage
Test the base voltage of V432
Normal
Abnormal
Normal
Abnormal
Check the voltage of all pins of XZ601
Heater Resistor open
Check to see if be voltage of V431 is existed?
Check the circuit from pin15 ofN201 to V432
Abnormal
YES
Normal
NO
Video amplifying board is abnormal
Inspect the circuit from pin50 、51、52 of N201 to video amplifying
Check the voltage of V432 collector is normal
InspectT402、R435 etc.
Higher
Lower
T402, VD403 or C415,C416 are broken
V432 is not well welded or open
Normal
Abnormal
Check to see if +3.3V voltage is normal at PIN 49 of N201
Change wrong component or check peripheral circuit
Normal
Abnormal
Check G201、N201 and peripheral circuit of N201
Check +3.3V ,+5V power

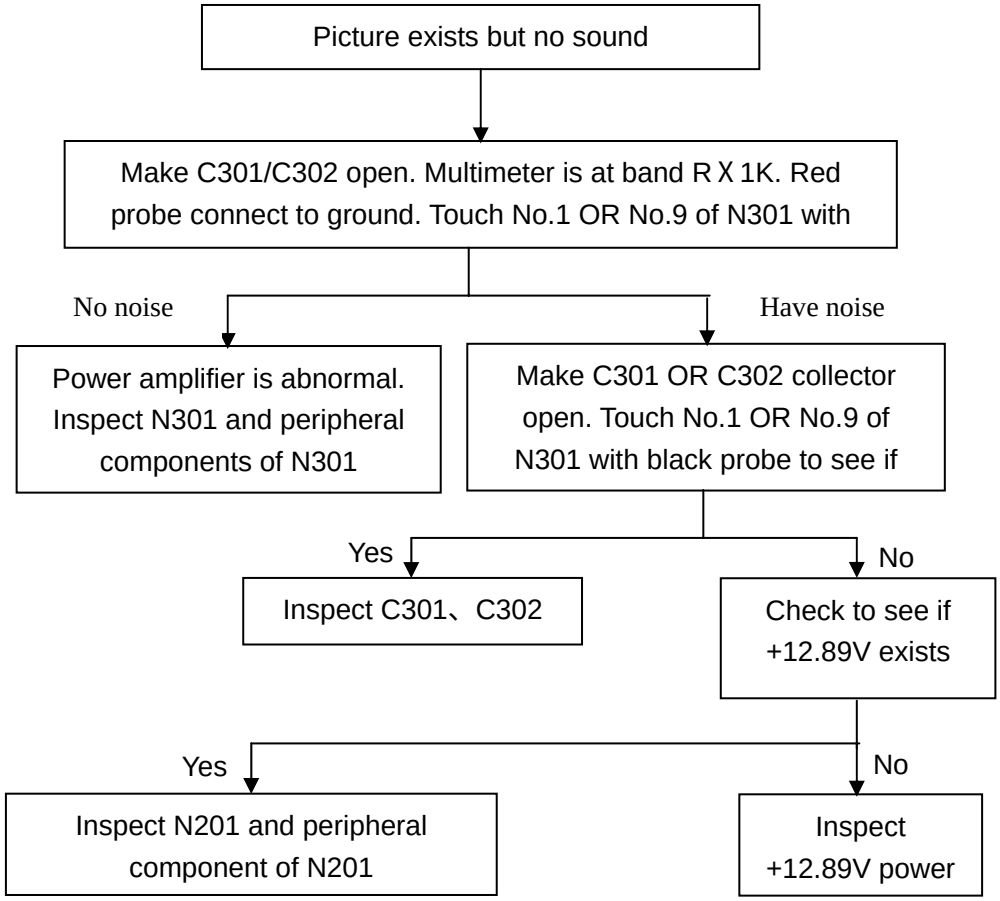
3


Horizontal bright line
Make R401 open. Multimeter is at range R X 1K. Red probe connects to ground. Touch No.5 of N401 with black probe. Bright line flashes for a moment
Yes
No
Check to see if the voltage of pin 15 and pin16 of N201 is normal
Check to see if voltage of pin2 at N401 is normal
Yes
No
Yes
No
Change N201 and repair circuit
Inspect N201 and peripheral components of N201
Check to see if the deflection yorks are connected, C408 is open or weldless. Inspect peripheral component of N401 and N401 itself
Inspect +28V power supply
Normal

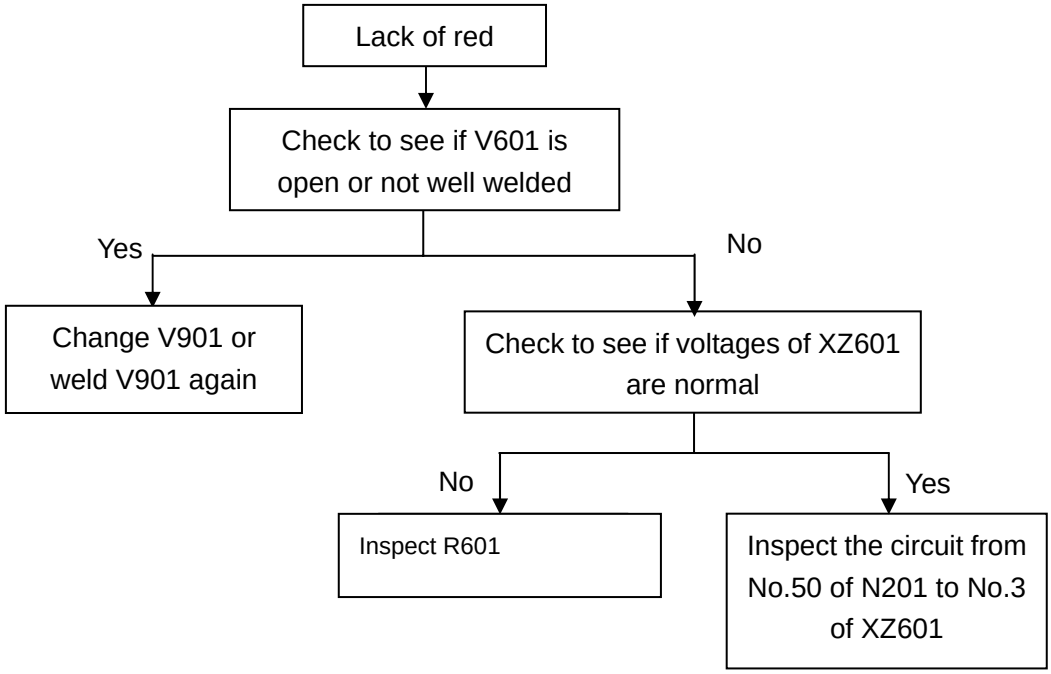
4.


No sound and picture
Snowy noise exist
Not exist
Exist
Check to see if RAGC is at 00 mode
Check to see if voltage output available at tuner
Yes
No
Yes
No
Enter D-MODE with customer remote controller. Make RAGC tuned to 25 or so. Noise on picture just disappears.
Inspect Z101、N201and PIF part
Antenna or tuner is abnormal
Inspect the circuit from CPU to tuner

5


Picture exists but no sound
Make C301/C302 open. Multimeter is at band R X 1K. Red probe connect to ground. Touch No.1 OR No.9 of N301 with
No noise
Have noise
Power amplifier is abnormal. Inspect N301 and peripheral components of N301
Make C301 OR C302 collector open. Touch No.1 OR No.9 of N301 with black probe to see if
Yes
No
Inspect C301、C302
Check to see if +12.89V exists
Yes
No
Inspect N201 and peripheral component of N201
Inspect +12.89V power

6.


Lack of red
Check to see if V601 is open or not well welded
Yes
No
Change V901 or weld V901 again
Check to see if voltages of XZ601 are normal
No
Yes
Inspect R601
Inspect the circuit from No.50 of N201 to No.3 of XZ601

Troubleshooting

- Before calling service personnel, please check the following chart for a possible cause to the trouble you are experiencing.

Symptom	Check these things
TV is not turned on	• Be sure the power cord is plugged in.
Good picture , no sound	• The MUTE function may be used. • Adjust the volume of the TV set.
Poor color / tint, good sound	• The contrast, color and tint may be incorrectly adjusted. • If you change the direction of the TV while the TV is on, the picture may suffer from color shading. If so, turn off the TV and allow about 30 minutes to cool, then turn on the TV again.
Spots appear on the screen	• The broadcast signal may be jammed by other electrical sources such as cars, motorcycles, electric trains, high tension lines, neon signs, hair dryers.
Lines appear on the screen	• The broadcast signal may be jammed by other TV receivers, personal computers, and TV games, as well as interference from radio stations.
Double images or ghosts	• Interference may be due to broadcast waves reflected from mountains or buildings. • Check if the direction of the antenna is changed.
Snowy picture or black screen	• The antenna may be disconnected or falling out. • Check if the direction of the antenna is changed.
Remote control does not work	• The batteries in the remote control may be exhausted. • The batteries may be improperly installed. • Check if there are obstacles between the remote control and the remote (infrared ray) receiver. • Check if there is strong light interference around the remote (infrared) receiver. • Check if the main power is ON.

The following conditions are not troubles

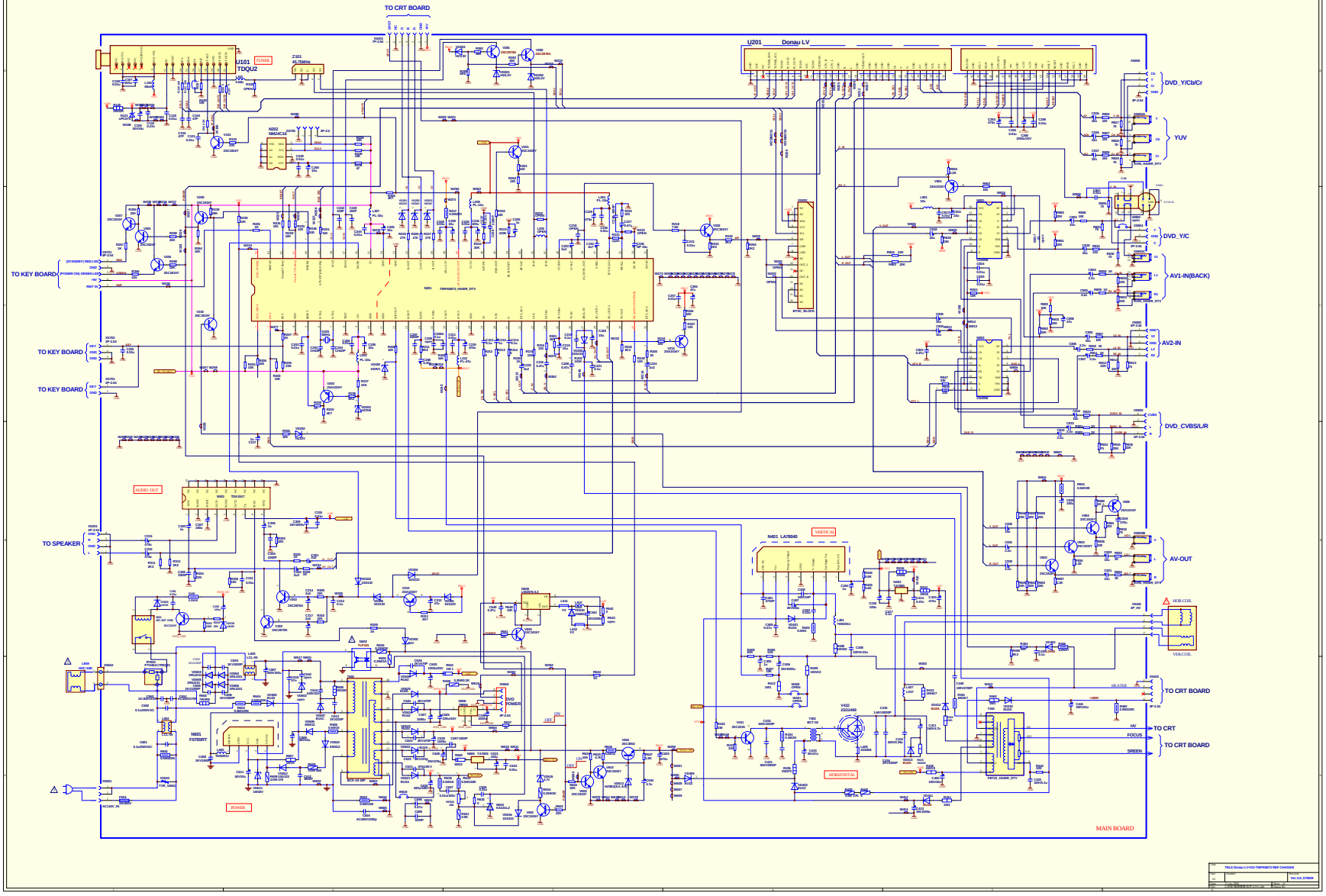
Clacking noise inside the receiver	• It may result from the expansion of the shell caused by a temperature change. This will not affect the picture and sound quality.
Uneven colour in a certain portion of the screen	• If the picture is too bright, this may occur according to the nature of the pictures. Reduce the contrast, it may resume to normal.

CAUTION

In case of problems, have your TV serviced by qualified personnel.Never attempt to service the set yourself since opening the cabinet may expose you to dangerous voltage or other hazards.

8. CIRCUIT DIAGRAM

TELS Donau LV+TMPA8873 Ref-Chassis for Haier Ver :3.0



Sincere Forever

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